

High-Level Design (HLD) – E-Commerce Website

Objective

To build a responsive and user-friendly eCommerce website using WordPress and MySQL, with WooCommerce as the core platform for managing products and orders. The system will integrate Google SSO for seamless user authentication, Razorpay for secure online payments, and Gmail SMTP for reliable transactional email delivery.

Product Name	Version	Document	Date	Author
MyOnlineStore	v1.0	High-Level Design (HLD)	25 April 2025	Udit Kumar Mozumder

2. Architecture Diagram

User --> Browser --> WordPress (Frontend - Woostify Theme)
|--> WooCommerce (Product, Cart, Orders)
|--> Google SSO (Login/Auth)
|--> WP Mail SMTP (Email Delivery)
|--> Razorpay API (Payments)
|--> MySQL (Database)

3. Modules and Components

3.1. Frontend (User Interface)

- Homepage
- Product Listing & Search
- Product Detail Page
- Cart & Checkout
- User Login/Signup (Google SSO & native)

3.2. Backend (Admin Panel)

- WordPress Dashboard
- WooCommerce Settings

- Product Management
- Order & Customer Management
- Plugin Configuration (SMTP, Razorpay, OAuth)

3.3. Authentication Module

- Google OAuth integration via Client ID & Secret
- Fallback to WordPress native login

3.4. Payment Module

- Razorpay plugin integration
- Support for UPI, cards, and net banking
- Payment success/failure webhooks handled in WooCommerce

3.5. Email Notifications

- SMTP relay using Gmail via WP Mail SMTP
- Templates: Order Received, Completed, Password Reset, Registration

3.6. Database Design (Simplified)

- wp_users: User details
- wp_posts: Products, Pages
- wp_woocommerce_orders: Order metadata
- wp_options: Site-wide configuration

4. Security Considerations

- Use SSL (HTTPS) for all pages
- Sanitize user input in forms
- Configure reCAPTCHA on login and contact forms
- App password for SMTP (no direct Gmail login)
- Payment handled via secure Razorpay endpoints

5. Non-Functional Requirements

- Uptime: 99.5%
- Response Time: < 3 seconds
- Mobile Responsive: Yes
- Browser Compatibility: Chrome, Firefox, Safari, Edge

6. Tools & Technologies

- CMS: WordPress
- eCommerce: WooCommerce
- Theme: Woostify
- Email: Gmail SMTP via WP Mail SMTP
- Auth: Google OAuth
- Payments: Razorpay
- Hosting: Shared/Cloud (e.g., InfinityFree, Hostinger)

7. Deployment Process

1. Setup hosting and domain
2. Install WordPress and configure database
3. Install & configure theme and plugins
4. Upload products and test workflows
5. Go live with SSL enabled

Testing Strategy

To ensure quality, functionality, and performance of the eCommerce website, the following testing strategy will be followed:

1. Functional Testing

- Product listing and detail pages
- Cart, checkout, and payment flows
- User registration/login (including Google SSO)
- Email notifications (order, password reset, etc.)

2. Integration Testing

- Gmail SMTP: Verify successful email delivery
- Google SSO: Test authentication flow across devices
- Razorpay: Validate payment success/failure scenarios

3. UI/UX Testing

- Mobile responsiveness (across devices and screen sizes)
- Cross-browser testing: Chrome, Firefox, Safari, Edge
- Usability review for smooth navigation and error handling

4. Performance Testing

- Page load speed (aim <3 seconds)
- Stress test checkout during high traffic

5. Security Testing

- SSL verification
- Input validation and form sanitization
- OAuth & payment gateway vulnerability check

6. User Acceptance Testing (UAT)

- Conducted with a closed group to validate the overall user experience and flow before go-live

Future Enhancements

The platform is designed to be modular and scalable. Potential enhancements include:

1. Mobile App Integration

- Launch a native or hybrid app for iOS and Android using WordPress REST API

2. Loyalty & Rewards System

- Offer points, cashback, or referral bonuses

3. Coupon and Discount Engine

- Introduce seasonal and user-based discount management

4. Inventory Management System

- Real-time stock tracking with alerts and analytics

5. Multi-Vendor Marketplace

- Allow third-party sellers to list and manage products (via plugins like Dokan)

6. Chatbot & Live Support

- Integrate WhatsApp or AI-powered chat for real-time support

7. Advanced Analytics Integration

- Google Analytics, Mixpanel

KPIs to Monitor

1. Customer Acquisition Cost (CAC)
2. Customer Lifetime Value (CLTV)
3. Total number of transactions in a month and unique users transaction.
4. Total order value
5. Total number of orders
6. Top 10 highest sold SKU and order value
7. Total number of users added per month.